The statistical analysis of „Safety" feature for payment cards with contactless payment function, cash and mobile payments in Poland. Results of own research

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ABSTRACT

During the last two decades, numerous innovative mobile payment services have been introduced to both developing and developed economies. Many mobile payment applications have been launched by mobile network operators. Although the Polish market of mobile payments is in the initial phase of development, it is one of the pioneering and leading in Europe and globally. The mobile payment industry in Poland is expected to reach US$ 26,893.9 million by 2025 (Poland Mobile Wallet 2019). The main purpose of this article is an attempt to answer the following question: how does "safety" feature influence consumer attention to use: payment cards without contactless payment function, cash and mobile payments?

Keywords: Payment card, cash, mobile payment.

1. INTRODUCTION

For consumers, different features influence the use of traditional (cash) or modern (mobile payment) types of payment. Payments are an inherent element of economic activity (CPMI and WBG 2016). However, the evolution of payment instruments and the way individuals and businesses make daily payments (cash, card with contactless payment function, mobile payment) has undergone enormous change in human history, particularly due to main innovations in payment systems in last decades (Gandhi 2016). The main purpose of this article is an attempt to answer the following question: how does "safety" feature influence consumer attention to use: payment cards without contactless payment function, cash and mobile payments?

2. EVOLUTION OF MONEY

The starting point for this analysis is to define the term of money. Unfortunately, it is almost impossible to define money in terms of its physical form or properties. Therefore, any definition should be based on its functions. Money performs five important functions. First function is medium of exchange. Second function is measure of value. Third function is store of value Fourth function is standard or deferred payment Fifth function is transfer of value. Of course, the functions of any particular form of money may change over time.

From the historical perspective, since early days of the human civilization people have exchanged goods and services in return for other goods and services (barter of goods that individuals perceived as valuables). This was efficient and accepted while human needs were few and limited. But when commercial activity increased, barter became insufficient, and people had to adopt other systems as units of exchange and measures of value. Thus, the idea of money emerged, which has been very important invention in the history of humanity (Téllez and Zeadally 2017).

The use of metal money began in parts of Asia around 2000 B.C. Gold and silver then became popular as an independent means of exchange because they were more or less divisible, easy to transport in small quantities and durable.

During the 18th century, paper notes gradually emerged as a uniform way of exchange encouraging foreign trade, which finally led to the system of representative (fiat) money (Rivera and Florig 2005).

By the 19th century, checks were the first cashless payment mode that was introduced followed by payment cards (credit and debit cards) in the mid-20th century (Garcia-Swartz et al. 2006).

Money is now shifting from its analogue past to its digital future (Reiss 2018). The latest generation of innovative payment instruments such as contactless (Shishmanov 2014) and mobile payment has been launched taking advantage of technological enhancements in data communication, which tend to further improve payment efficiency by reducing transactions costs and simultaneously foster electronic ways of paying (Cocosila and Trabelsi 2015).

Nowadays, with the growing penetration of the mobile phone (Nemer 2018) the mobile payment is becoming an uncontested mode for paying goods. Almost everyone owns a mobile phone (Mensch 2016) and paying with your smartphone might turn out to be the next natural step in the evolution of payments (Evans 2014).

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The empirical data obtained were statistically analysed with the use of cross tables. In order to determine the significance of differentiation between three independent measurement groups, ANOVA univariate analysis test was used (homogeneity of variance was examined by Leven test, used the Bonferroni Post Hoc Test and the Games-Howell Post Hoc Test). The associations between two ordinal variables were analysed with the use of Spearman's rank correlation (r). In all analyses, the level of statistical significance was $p < 0,05$.

The study was conducted among people living in Poland. The study was carried out in the period of February 2018 - September 2018. The number of respondents covered by the study is 1358 respondents. According to the information from the survey (1358 respondents), 60,53% (822 respondents) of the respondents are female, and 39,47% (536 respondents) are male.

For the respondents, mobile payments are the safest (M=3,7684), the least safe is cash (M=3,501).

Figure 1. Rate the feature: Safety
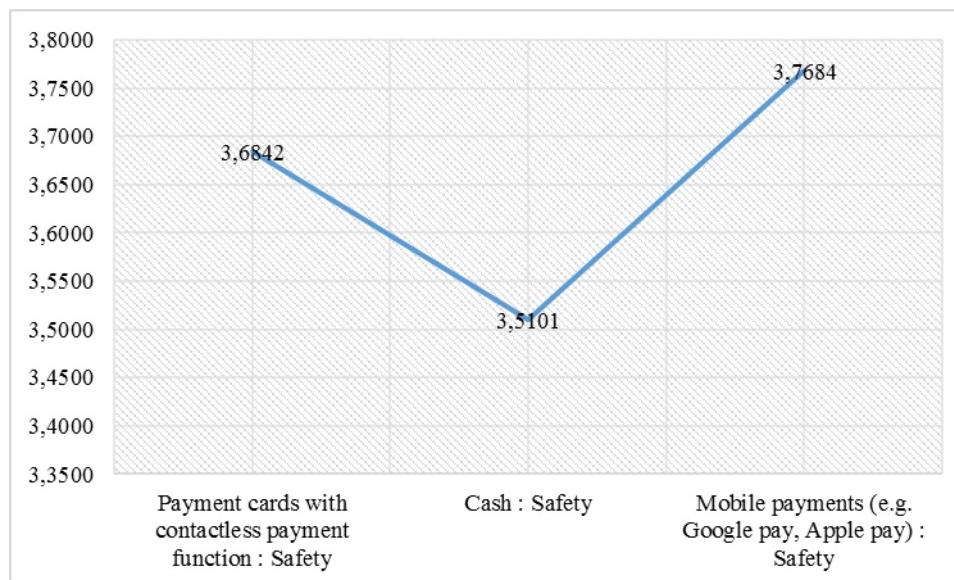
Source: Own analysis.

Focusing on the relationship between the *safety* feature and - *convenience*, *speed*, *availability*, *ease of use* features, I calculated the relationship between them with the use of Spearman's rho correlation coefficient. For payment cards with contactless payment function, the strongest positive correlation is between *safety* and *convenience* (r = 0,288; p = 0,001; N = 1081).

Table 1. The correlation between factors of payment cards with contactless payment function (Spearman's rho correlation coefficient)

		Card Convenience	Card Speed	Card Availability	Card Easeofuse	Card Safety
Card Safety	Correlation Coefficient	,288**	,232**	,168**	,053	1,000
	Sig. (2-tailed)	,000	,000	,000	,079	.
	N	1081	1086	1085	1086	1086

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Own analysis.

For cash, the strongest positive correlation is between *safety* and *convenience* (r = 0,277; p = 0,001; N = 1086).

Table 2. The correlation between factors of cash function (Spearman's rho correlation coefficient)

		Cash Safety	Cash Convenience	Cash Speed	Cash Availability	Cash Ease of use
Cash Safety	Correlation Coefficient	1,000	,277**	,269**	,206**	,235**
	Sig. (2-tailed)	.	,000	,000	,000	,000
	N	1086	1086	1086	1086	1085

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Own analysis.

For mobile payment, the strongest positive correlation is between *safety* and *convenience* (r = 0,590; p = 0,001; N = 842).

Table 3. The correlation between factors of mobile payment function (Spearman's rho correlation coefficient)

		Mpayment Safety	Mpayment Convenience	Mpayment Speed	Mpayment Availability	Mpayment Ease of use
Mpayment Safety	Correlation Coefficient	1,000	,590**	,505**	,477**	,565**
	Sig. (2-tailed)	.	,000	,000	,000	,000
	N	842	842	842	842	842

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Own analysis

The next aspect in the analysis of m-payments market, is the use of independent t-tests to examine the differences of rated features for males and females. First, I analyze the payment cards with contactless payment function.

The first aspect, is the *safety* feature of payment cards with contactless payment function. The feature is stronger for women (N = 611; M = 3,75; SD = 1,02) than for men (N = 475; M = 4,60; SD = 0,94). A t-test found the difference between the means of safety of payment cards with contactless payment function for the two groups to be statistically significant at a p < 0,05 level (t(1053) = - 2,437, p = 0,001).

Next analyzed method of payment is cash. The first aspect, is *safety* feature of cash. The feature is stronger for men (N = 475; M = 3,62; SD = 0,30) than for women (N = 611; M = 3,42; SD = 1,29). A t-test found the difference between the means of safety of cash for the two groups to be statistically significant at a p < 0,05 level (t(948) = 3,147, p = 0,002).

Next analyzed method of payment is mobile payment. The first aspect, is the *safety* feature of mobile payment. The feature is stronger for men (N = 387; M = 3,98; SD = 0,77) than for women (N = 455; M = 3,59; SD = 0,77). A t-test found the difference between the means of safety of mobile payment for the two groups to be statistically significant at a p < 0,05 level (t(840) = 3,758, p = 0,001).

To examine the differences between *monthly income* groups (500 EUR and below, 501-750 EUR and 751-2500 EUR) of rated features I used an analysis of variance (ANOVA).

ANOVA revealed that there are differences in the analyzed *monthly income* groups [1] $(F(2, 839) = 28,395; p = 0,001)$ in the *safety* feature of payment cards with contactless payment function. Generally, the respondents with higher monthly income, rate the safety feature of payment cards with contactless payment function higher.

The respondents with monthly income of 500 EUR and below $(M = 3,30; SD = 1,05)$ rated this feature lower than the respondents with monthly income 501-750 EUR $(M = 3,78; SD = 1,05)$ and the respondents with monthly income 751-2500 EUR $(M = 3,89; SD = 0,91)$.

The Bonferroni Post Hoc Test demonstrated that the differences between the groups were significant $(p < 0,05)$, except the respondents with monthly income of 501-750 EUR and monthly income 751-2500 EUR $(p = 0,51)$.

Figure 2. *Safety* **feature of payment cards with contactless payment function (monthly income: 500 EUR and below, 501-750 EUR, 751-2500 EUR)**
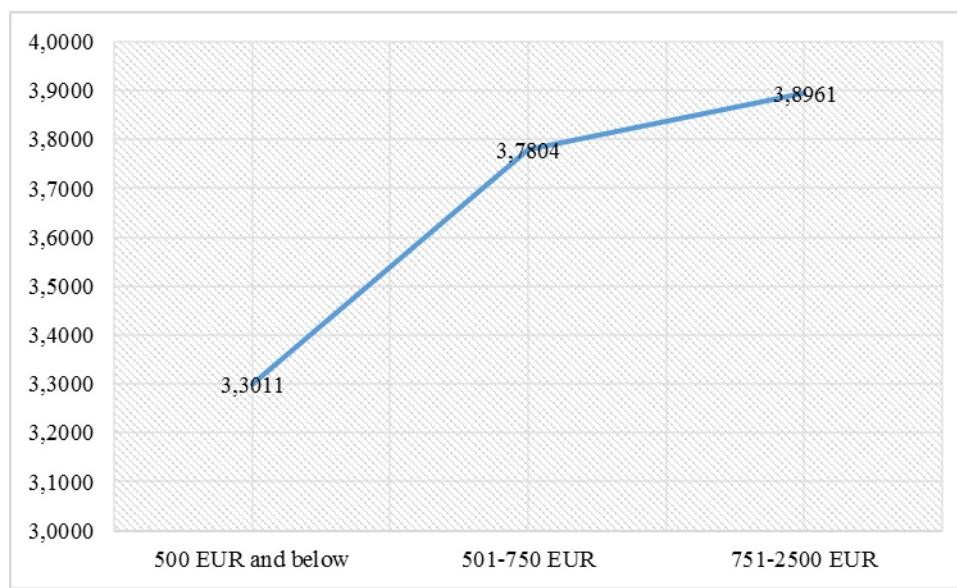
Source: Own analysis.

3. CONCLUSION

Presenting the results of the research conducted among consumers it must be emphasized that *safety* and *convenience* features are correlated, no matter of analysed type of payment - cash, card with contactless payment function, mobile payment. It is worth to add, that this relation is strongest for the mobile payment.

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